

Claims.

1 1. A method of monitoring performance of a communications
2 network, comprising the steps of:

3 coupling a first communication channel and a second commu-
4 nication channel together in a protection-switching configura-
5 tion;

6 simultaneously monitoring said first communication channel
7 and said second communication channel so as to accumulate per-
8 formance data of one of said channels in an active counter;

9 detecting a protection switchover between said first commu-
10 nication channel and said second communication channel; and

11 thereafter accumulating performance data of another of said
12 channels in said active counter.

1 2. The method according to claim 1, further comprising the
2 steps of:

3 memorizing a value of said active counter following expira-
4 tion of a read interval; and

5 resetting said active counter.

1 3. The method according to claim 1, wherein said communica-
2 tions network is an optical communications network.

1 4. The method according to claim 3, wherein said communica-
2 tions network is a SONET network.

1 5. The method according to claim 3, wherein said communica-
2 tions network is an SDH network.

1 6. The method according to claim 1, wherein said protec-
2 tion-switching configuration is a 1+1 architecture.

1 7. The method according to claim 1, wherein said protec-
2 tion-switching configuration is a 1:1 architecture.

1 8. The method according to claim 1, wherein said protec-
2 tion-switching configuration is a 1:n architecture.

1 9. A method of monitoring performance of a communications
2 network, comprising the steps of:

3 coupling a first communication channel and a second commu-
4 nication channel together in a protection-switching configura-
5 tion, in which one of said channels operates as an active chan-
6 nel;

7 simultaneously monitoring said first communication channel
8 and said second communication channel so as to accumulate first
9 performance data in a first counter and second performance data
10 in a second counter with respect to said first communication
11 channel and said second communication channel respectively;

12 while said first communication channel is operating as said
13 active channel, accumulating said first performance data in a
14 third counter;

15 detecting a protection switchover between said first commu-
16 nication channel and said second communication channel; and

17 thereafter accumulating said second performance data in
18 said third counter.

1 10. The method according to claim 9, further comprising the
2 steps of:

3 after performing said step of detecting said protection
4 switchover and prior to performing said step of accumulating
5 said second performance data in said third counter;
6 resetting said first counter, and
7 resetting said second counter.

1 11. The method according to claim 9, further comprising the
2 steps of:
3 memorizing a value of said third counter following expira-
4 tion of a read interval; and
5 resetting said third counter.

1 12. The method according to claim 9, further comprising the
2 step of:
3 after performing said step of detecting said protection
4 switchover delaying performance of said step of accumulating
5 said second performance data in said third counter until expi-
6 ration of a read interval.

1 13. The method according to claim 9, wherein said protec-
2 tion-switching configuration is a 1+1 architecture.

1 14. The method according to claim 9, wherein said protec-
2 tion-switching configuration is a 1:1 architecture.

1 15. The method according to claim 9, wherein said protec-
2 tion-switching configuration is a 1:n architecture.

1 16. A method of monitoring performance of a data network,
2 comprising the steps of:

3 monitoring a first channel of an optical communications
4 network;

5 simultaneously monitoring a second channel of said optical
6 communications network;

7 accumulating first data that is received on said first
8 channel in a first counter;

9 accumulating second data that is received on said second
10 channel in a second counter;

11 accumulating said first data in a third counter;

12 detecting a protection switchover between said first chan-
13 nel and said second channel; and

14 thereafter accumulating said second data in said third
15 counter.

1 17. The method according to claim 16, further comprising
2 the steps of:

3 after performing said step of detecting said protection
4 switchover and prior to performing said step of accumulating
5 said second data in said third counter;

6 resetting said first counter; and

7 resetting said second counter.

1 18. The method according to claim 16, further comprising
2 the steps of:

3 memorizing a value of said third counter following expira-
4 tion of a read interval; and

5 resetting said third counter.

1 19. The method according to claim 16, further comprising
2 the step of:

3 after performing said step of detecting said protection
4 switchover delaying performance of said step of accumulating
5 said second data in said third counter until expiration of a
6 read interval.

1 20. The method according to claim 16, wherein said steps of
2 monitoring said first channel and monitoring said second chan-
3 nel are performed at a system interface.

1 21. The method according to claim 16, wherein said optical
2 communications network is an SDH network.

1 22. A method of monitoring performance of a data network,
2 comprising the steps of:
3 monitoring a first channel in a SONET network;
4 simultaneously monitoring a second channel in said SONET
5 network;
6 accumulating first data that is received on said first
7 channel in a first counter;
8 accumulating second data that is received on said second
9 channel in a second counter;
10 accumulating said first data in a third counter;
11 detecting a protection switchover between said first chan-
12 nel and said second channel; and
13 thereafter accumulating said second data in said third
14 counter.

1 23. The method according to claim 22, further comprising
2 the steps of:

3 after performing said step of detecting said protection
4 switchover and prior to performing said step of accumulating
5 said second data in said third counter;
6 resetting said first counter; and
7 resetting said second counter.

1 24. The method according to claim 22, further comprising
2 the steps of:
3 memorizing a value of said third counter following expira-
4 tion of a read interval; and
5 resetting said third counter.

1 25. The method according to claim 22, further comprising
2 the step of:
3 after performing said step of detecting said protection
4 switchover delaying performance of said step of accumulating
5 said second data in said third counter until expiration of a
6 read interval.

1 26. The method according to claim 22, wherein said steps of
2 monitoring said first channel and monitoring said second chan-
3 nel are performed at a system interface of said SONET network.

1 27. A performance monitoring apparatus for a data network,
2 comprising:
3 a first port connectable to a first channel of a communica-
4 tions network;
5 a second port connectable to a second channel of said com-
6 munications network;
7 a first counter for accumulating first data that is re-
8 ceived in said first port;

9 a second counter for accumulating second data that is re-
10 ceived in said second port;

11 a third counter;

12 a switch for associating said third counter with one of
13 said first port and said second port, said third counter accu-
14 mulating one of said first data and said second data responsive
15 to said switch; and

16 a processor for controlling said first counter, said second
17 counter, said third counter and said switch;

18 wherein in a first mode of operation said first counter and
19 said third counter accumulate said first data, and said second
20 counter accumulates said second data; and

21 in a second mode of operation said first counter accumu-
22 lates said first data, and said second counter and said third
23 counter accumulate said second data.

1 28. The performance monitoring apparatus according to
2 claim 27, further comprising a data memory accessible by said
3 processor, wherein responsive to control signals of said proc-
4 essor, values accumulated in said first counter, said second
5 counter, and said third counter are stored in said data memory.

1 29. The performance monitoring apparatus according to
2 claim 28, wherein said control signals are generated at prede-
3 fined read intervals.

1 30. The performance monitoring apparatus according to
2 claim 27, wherein said first counter, said second counter, and
3 said third counter are software counters.

1 31. The performance monitoring apparatus according to
2 claim 27, wherein said first port and said second port are dis-
3 posed at a systems interface of said communications network.

1 32. The performance monitoring apparatus according to
2 claim 27, wherein said communications network is an optical
3 communications network.

1 33. The performance monitoring apparatus according to
2 claim 32, wherein said optical communications network is a
3 SONET network.

1 34. The performance monitoring apparatus according to
2 claim 32, wherein said optical communications network is an SDH
3 network.

1 35. A performance monitoring apparatus for a data network,
2 comprising:

3 a first module and a second module, each of said first mod-
4 ule and said second module comprising:

5 a first port connectable to a first channel of a communica-
6 tions network;

7 a second port connectable to a second channel of said com-
8 munications network;

9 a first counter for accumulating first data that is re-
10 ceived in said first port;

11 a second counter for accumulating second data that is re-
12 ceived in said second port;

13 a third counter;

14 a switch for associating said third counter with one of
15 said first port and said second port, said third counter accu-

16 mutating one of said first data and said second data responsive
17 to said switch; and

18 a processor for controlling said first counter, said second
19 counter, said third counter and said switch;

20 wherein in a first mode of operation said first counter of
21 said first module and said third counter of said first module
22 accumulate said first data and said second counter of said sec-
23 ond module accumulates said second data; and

24 in a second mode of operation said second counter of said
25 first module accumulates said first data, and said first coun-
26 ter of said second module and said third counter of said second
27 module accumulates said second data.

1 36. The performance monitoring apparatus according to
2 claim 35, further comprising a data memory, wherein values held
3 in said first counter, said second counter, and said third
4 counter are periodically stored in said data memory responsive
5 to control signals of said processor.

1 37. The performance monitoring apparatus according to
2 claim 35, wherein said first counter, said second counter, and
3 said third counter are software counters.

1 38. The performance monitoring apparatus according to
2 claim 35, wherein said first module and said second module are
3 disposed at a systems interface of said communications network.

1 39. The performance monitoring apparatus according to
2 claim 35, wherein said communications network is an optical
3 communications network.

1 40. The performance monitoring apparatus according to
2 claim 39, wherein said optical communications network is a
3 SONET network.

1 41. The performance monitoring apparatus according to
2 claim 39, wherein said optical communications network is an SDH
3 network.

1 42. The performance monitoring apparatus according to claim
2 35, wherein responsive to control signals of said processor, a
3 content of said third counter of said first module is trans-
4 ferred to said third counter of said second module.